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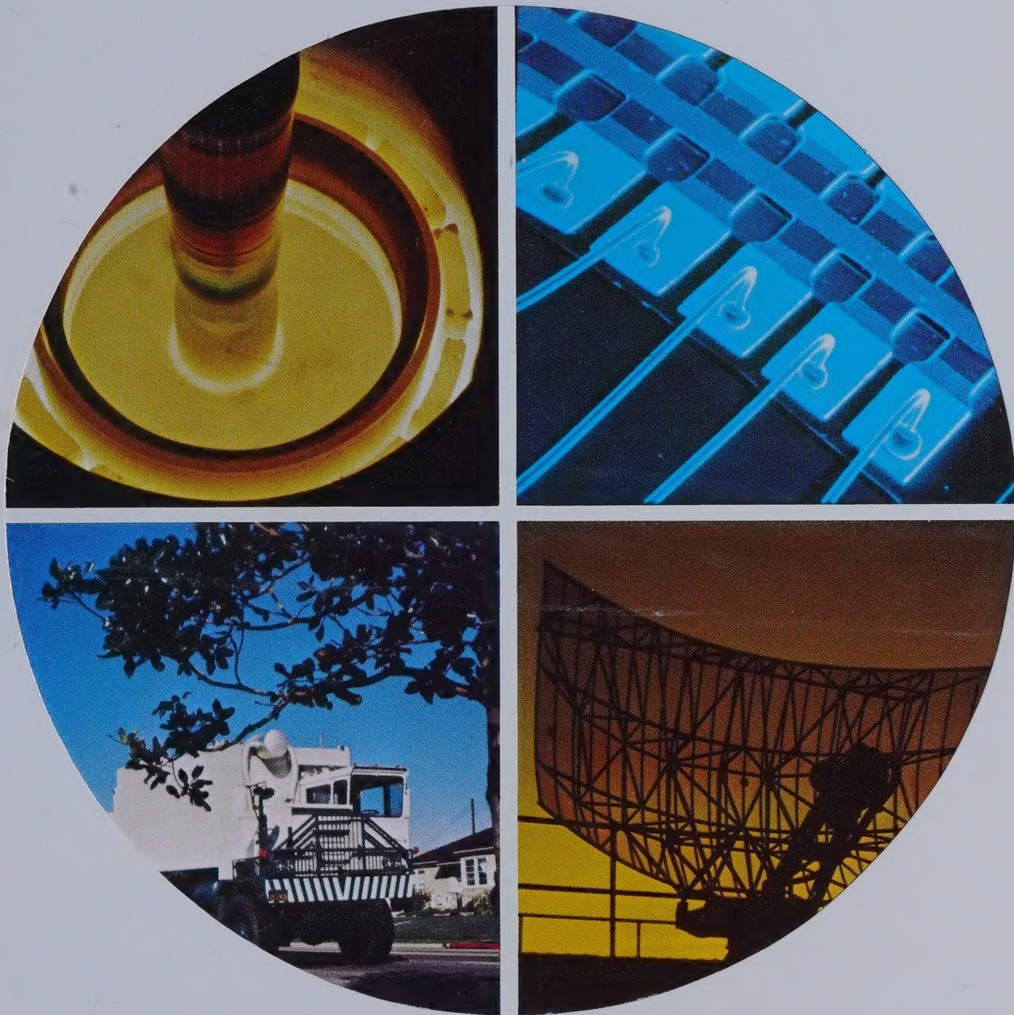


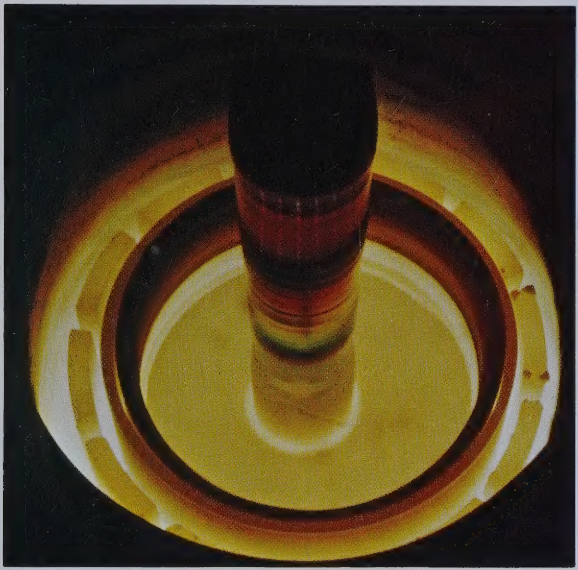
1968 ANNUAL REPORT

Annual Meeting of Stockholders

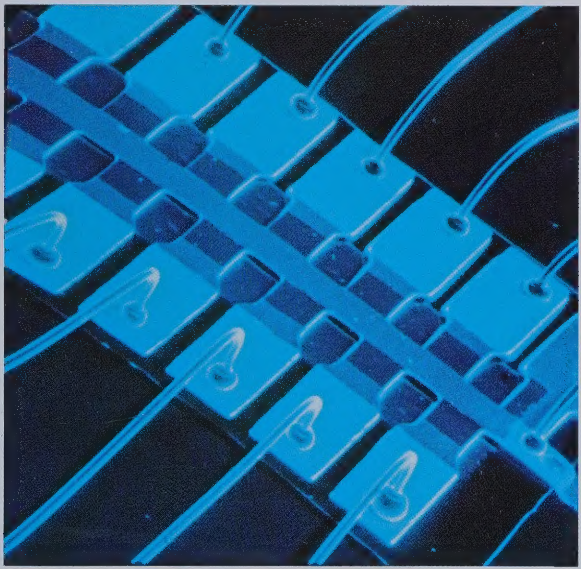
The 1969 Annual Meeting of stockholders of Texas Instruments Incorporated will take place at 10:00 a.m. (CST), Wednesday, April 16, in the North Building Cafeteria at 13500 North Central Expressway, Dallas, Texas.

Table of Contents

Two-inch-diameter single crystal rod emerges from a pool of silicon in a "crystal puller." TI is a major producer and user of semiconductor-grade silicon.



Effectiveness of an advanced airborne infrared reconnaissance system depends on this one-tenth-inch array of detectors made from TI mercury cadmium telluride material.



Soundproofed TI seismic trucks with non-dynamite energy source operate quietly in residential area; digital processing removes traffic vibrations from seismic data.

Antennas for TI airport surveillance radar systems are seen at many major airports. TI is developing a new generation of ASR radar based on solid-state devices.

THE BUSINESS OF TEXAS INSTRUMENTS

This Annual Report presents highlights of TI's business in 1968, especially how customer problems have been solved by applying the total capabilities of the company. To put this report of the year in perspective with TI's overall aims as a business institution, the preamble of the Corporate Objective is quoted below:

"Texas Instruments exists to create, make and market useful products and services to satisfy the needs of our customers throughout the Free World. Because economic wealth is essential to the development of our society, we measure ourselves by the extent to which we contribute to that economic wealth—as expressed by sales growth and asset return. We believe our effectiveness in serving our customers and contributing to the economic wealth of society will be determined by our innovative skills."

CONSOLIDATED FINANCIAL SUMMARY

In thousands of dollars

	1968	*1967*
Net sales	$671,230	$568,507
Income before taxes and other provisions	50,362	41,098
Net income	26,324	22,855
Earned per common share (average outstanding during year)	2.41	2.11
Dividends declared on common stock	8,738	8,687
—paid per common share	.80	.75
Current assets	277,393	242,915
Current liabilities	120,235	97,520
Working capital	157,158	145,395
Property, plant, and equipment (less accumulated depreciation)	145,835	138,883
Long-term debt	52,927	54,265
Shareowners' equity	253,462	234,134
Book value per share of common stock outstanding at year end	23.17	21.53
Common shares (average outstanding during year)	10,909,686	10,845,663
Employees at year end	46,747	38,736
Shareowners at year end	18,649	20,065

TO THE SHAREOWNERS OF TEXAS INSTRUMENTS INCORPORATED

Financial review

Texas Instruments sales billed and year-end order backlog both reached all-time highs in 1968. Sales billed increased to $671.2 million, 18% higher than in 1967. The backlog of unfilled orders for products and services at the end of 1968 was $355 million, up from $306 million a year earlier.

Earnings of $2.41 per share in 1968 were 14% above 1967. The earnings increase would have been 23% if the 10% Federal corporate tax surcharge had not been in effect.

Each of the three major operating groups (Materials and Services, Components, and Equipment) had higher sales billed than in 1967, with the largest increase in the Equipment group. Profitability of the geophysical services and metallurgical materials businesses, which had severe problems in 1967, improved substantially. The Components group gained strength in 1968 despite intensive competitive pressures. Rapid growth in integrated circuits was particularly gratifying.

Although 1968 earnings improved over 1967, they did not reach desired levels. Manufacturing margins were below goals, and major efforts are being devoted to achieve the needed improvements. Support for technical effort continues at high levels to achieve long-term objectives despite the effect on short-term earnings.

Total Technical Effort increased

Expenditures in 1968 for Total Technical Effort, one measure of the technological nature of TI's business, were approximately $130 million. This is $30 million more than in 1967. About 60% of the total was supported by outside contracts, principally with the U.S. Government.

In addition to research and development of new products and technologies, Total Technical Effort includes expenditures for mechanization design, process development, and the engineering support needed by manufacturing and marketing. An exceptionally fast rate of technological innovation characterizes most of TI's businesses, and such investment in technical effort is essential to ensure future growth and profitability. There are numerous examples throughout this report of new products, processes, and technologies resulting from these expenditures.

TI's diversity is illustrated by activities on this 500-acre site in Dallas. A total of 3.5 million gross square feet of building space is devoted to (1) electronic equipment and systems, corporate offices, (2) semiconductor devices, (3) semiconductor integrated circuits, geophysical services, (4) corporate research and engineering, (5) chemical materials.

Materials:

1968 production and profits up

Metallurgical and chemical materials operations made substantial progress in sales billed, profits and product diversification during 1968. A higher level of clad-metal output made more efficient use of the manufacturing capacity added in TI's Attleboro, Massachusetts, plant during recent years. Special project team emphasis on individual product costs and yields, particularly the short-run, small-volume items, also was effective in improving manufacturing margins.

Substantial saving of copper

TI gained momentum in 1968 in its program to develop clad-metal combinations to replace or conserve materials in uncertain supply. One of the most effective efforts was a contract with the U.S. Government to supply copper-alloy clad steel bullet jacket material. Because TI's material contains only 20% of the copper required by the previously used alloy, more than 10 million pounds of copper was saved in one year of production.

Another growth product was *TI-Guard* copper-clad stainless steel, increasingly specified by architects for building construction. TI also shipped copper-clad aluminum wire in quantity for applications in electrical and electronics fields, including coaxial cables for community antenna systems (CATV).

Larger crystals lower device cost

The chemical materials business benefited from larger orders for semiconductor-grade silicon as integrated circuit requirements continued to increase. During 1968 the major manufacturing emphasis was placed successfully on increasing the diameter of silicon crystals to two inches from the previous industry average of one and one-fourth inches. Experimental work progressed on even larger sizes. The larger diameters help reduce the production costs per device of semiconductor manufacturers because of the fewer steps required for handling and processing.

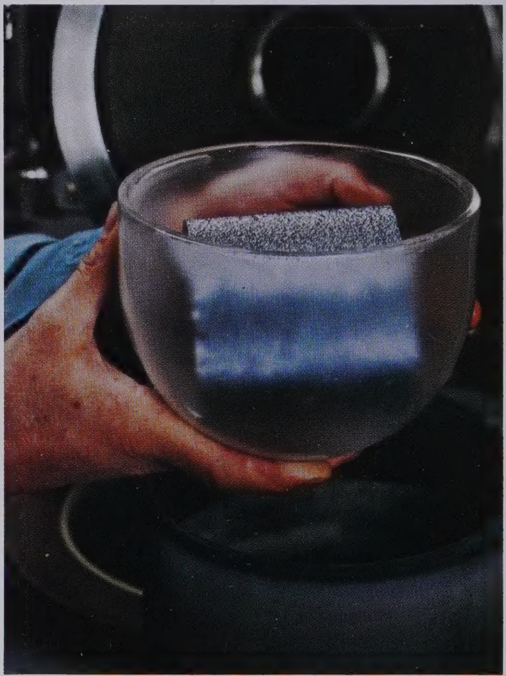
Silicon material production capacity was expanded in Dallas, and a new production facility was installed in the United Kingdom to serve expanding European markets.

Pilot plant makes high-purity quartz

TI's new method for manufacturing quartz (fused silica) in custom shapes was established on a pilot-line basis in 1968. The extremely high purity obtainable in TI's proprietary process is an important characteristic for many applications, such as crucibles for silicon refining. Promising results also were obtained on initial fabrication of close-tolerance tubing, tactical missile radomes, and quartz "flats" for solar-cell windows.

TI-KOTE silicon carbide products continued in production for the semi-

Architects specify TI-Guard copper-clad stainless steel for such uses as this apartment roof because of its beauty, durability, light weight, and reasonable cost.



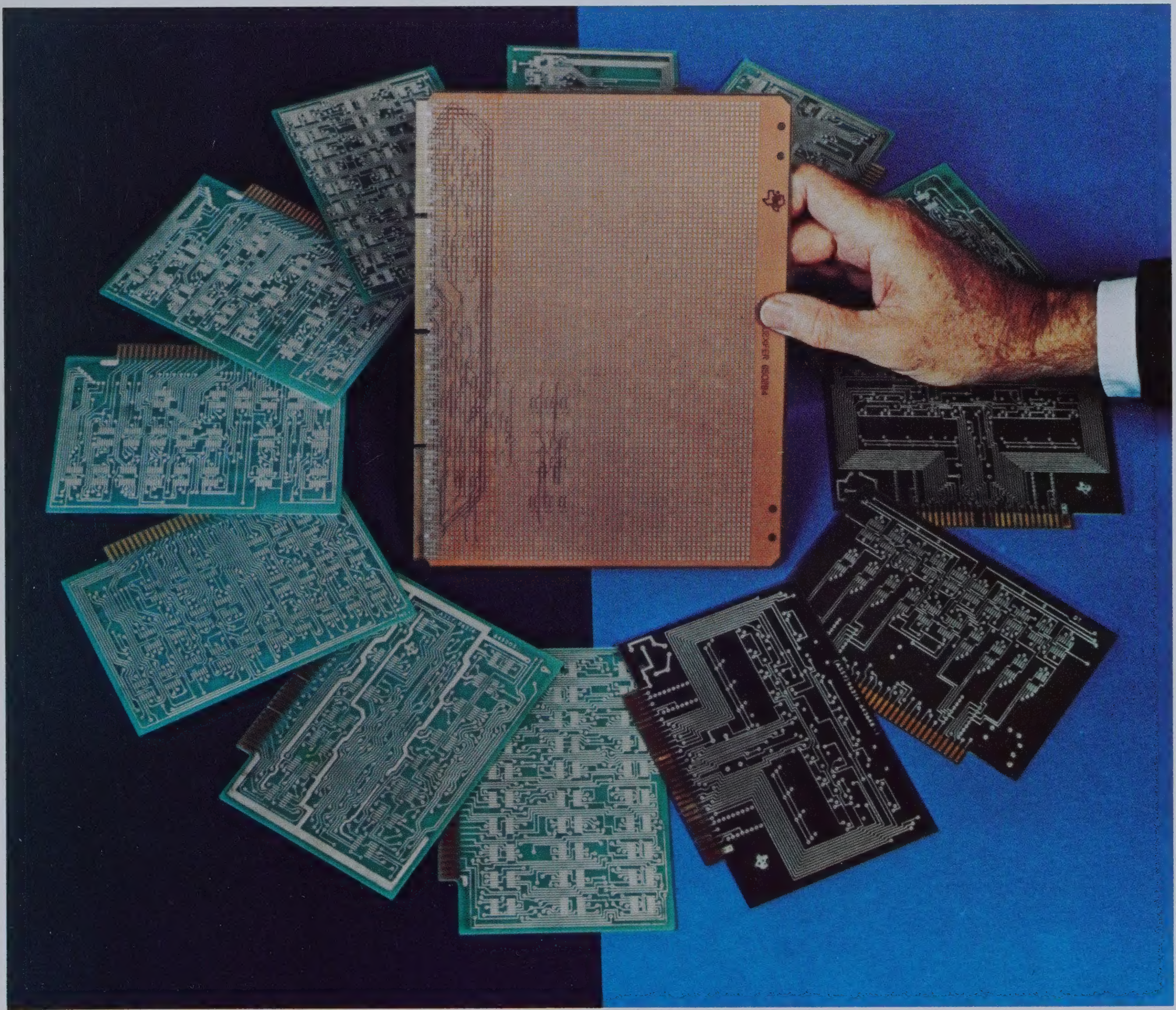
High-purity TI quartz crucible is loaded with silicon for placing in "crystal pulling" unit.

conductor and papermaking industries. Additional development work was conducted on the deposition of carbide coatings on metallic bases. Products made by this method have superior resistance to erosion, abrasion and the effects of high temperature. For example, encouraging results have been obtained in erosion protection of several products, including military aircraft jet turbine blades and chemical pump seals.

Multilayer circuit boards, many computer-designed, were delivered in high volume during 1968. For high speed integrated circuit operation in new complex electronic systems, the interconnections must be short, shielded and reliable. These are all requirements that the company's multilayer circuit boards meet well.

A new line of advanced connectors for use with integrated circuits was marketed to original equipment manufacturers and through distributors in the U.S. and Europe.

These interconnection systems are good examples of TI's vertical integration, coupling materials, components and system technologies.



The multilayer circuit board held here interconnects large numbers of integrated circuits. It has 17 layers; is ⅛-in. thick. It could replace all the conventional etched circuit boards in the picture. Uses include computers, avionics, communications.

Components:

New products, new markets

TI's components business turned upward in sales billed in 1968 and added significant strength to its technological and market position in areas described in the following pages.

The total U.S. semiconductor market overcame the 1967 interruption in its long-term growth pattern and gained 6%—to an estimated $1083 million in 1968. The total European semiconductor market, although about a third the size of the U.S. market, grew in 1968 at twice the U.S. rate.

In the U.S., TI's continued rapid growth in integrated circuit sales more than offset the anticipated decline in sales of discrete semiconductor devices such as transistors and diodes. TI's European semiconductor sales growth rate substantially exceeded that of the area's total market.

Customer engineering expanded

TI's Customer Engineering Center (CEC) expanded in 1968. It is a vital communications link between TI's component specialists and customers' systems designers. It is staffed by highly specialized men who have access to technical skills throughout the company. By participating early in a customer's design cycle, CEC can identify problems that can be solved with the most advanced component technologies available.

Through use of computer-aided design, plus fabrication equipment for CEC's exclusive use, rapid delivery of custom prototype circuits can be made to match schedule requirements for system design. Such custom approaches allow optimum design of the system as well as the components.

Programs that have been aided by CEC include a commercial aircraft communications system, a compact computer module for an automobile skid-avoidance system, and a new type of radar processor.

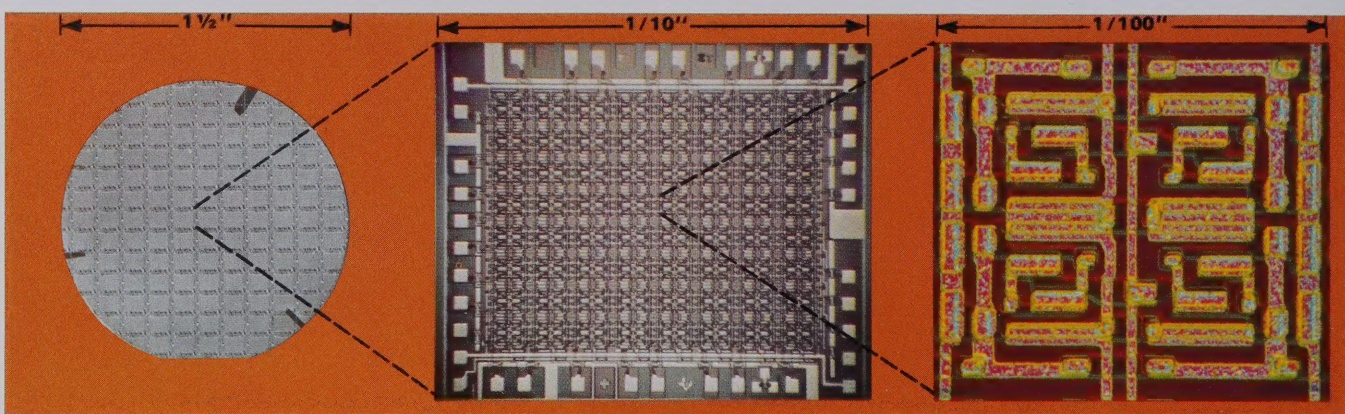
Computer aids in design

A related major customer service activity is computer-aided design centered in another group of specialists. This group has developed computer programs to perform the normally time-consuming, repetitive and routine tasks of circuit design, analysis, testing, and interconnection, thus freeing engineers and technicians for more creative work. This approach is applied not only at the component level but also at successive stages, including hybrid circuits, multilayer circuit boards, subsystems, and systems. (Hybrid circuits have miniature transistor and diode elements mounted on a ceramic base and interconnected by metallic paths.) Customer benefits include faster, high-accuracy response to his requirements for prototypes or short production runs. For example, designs for multilayer circuit boards formerly requiring months to complete now are done routinely in a few weeks.

TTL circuits new industry leader

TI has achieved a strong leadership role in the Transistor-Transistor Logic (TTL) integrated circuit market. Demand in the U.S. for these circuits grew steadily and, in November, their shipments for the first time exceeded those of Diode-Transistor Logic (DTL) circuits, the previous industry leader. A similar trend was noted in Europe. TTL circuits are favored because generally they operate faster than DTL types, are less affected by extraneous electrical "signals," and offer the circuit designer more flexibility. It is estimated more than two thirds of the products recently designed with digital integrated circuits use TTL types.

With the TTL production base well established, TI began increasing the number of basic circuits (gates) in each silicon chip, entering the range of Medium Scale Integration. MSI is defined as 12 to 100 equivalent gates per chip. By comparison, conventional integrated circuits have less than 12 gates in a chip and Large Scale Integration (LSI) more than 100 in a full silicon slice. System interconnection



More than 90 MOS chips are formed within this 1½-in. silicon slice.

Each of the chips is a computer memory circuit. Its 2048 transistors make up 512 gates.

These 32 transistors make up 8 gates. Small size lowers cost per electronic function.

and assembly costs are reduced and reliability increased by placing more circuits on a single MSI chip or LSI slice. TI is producing custom MSI circuits for such applications as desk-top calculators and airborne computers.

New circuits for computers

Among the 105 integrated circuits introduced by TI during 1968 were 29 in a new line of high-speed Emitter-Coupled Logic (ECL) digital circuits. They are particularly important because they are being designed into the ultra-fast, next-generation computers. Linear integrated circuits also grew in importance as sense amplifiers for computer applications.

More than a dozen types of Metal Oxide Semiconductor (MOS) integrated circuits were produced on a pilot-line basis in 1968. Facilities to make them in large volume will be completed in the Houston plant in the first quarter of 1969. Although these circuits currently operate slower than bipolar types such as TTL, they are well-suited for such human-operated applications as microfilm readers and stock market displays.

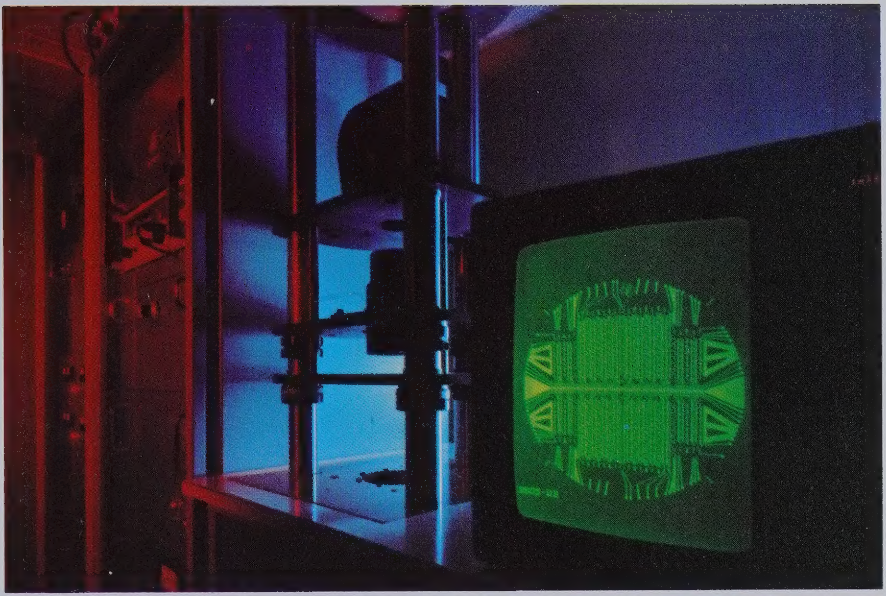
Because more MOS circuits can be built on a single silicon slice, with fewer process steps, the cost of each circuit is lower than bipolar circuits. Their lower cost and high circuit density make MOS circuits desirable for certain computer memory applications.

A TI computer-aided design technique has reduced the normal design cycle for MOS circuits by 50%. This makes it feasible to provide custom designs faster and at less cost.

Large Scale Integration (LSI)—from lab bench to pilot line

LSI moved beyond the development stage in 1968. The first design commitments to use LSI in military hardware production were made, and the company delivered LSI arrays for two Air Force production programs and four other systems in the design stage.

An important TI concept in LSI pro-



Top, composite of computer-generated interconnection patterns required for each discretionary-wired LSI array is shown in green image on cathode ray tube monitor at right. Bottom, operator starts automatic probe to test sequentially all integrated circuits on a silicon slice. TI factory system computer controls probe positioning, testing and recording.

duction is "discretionary wiring." A computerized system built by the company tests each of the hundreds of circuits on a silicon slice, notes the location of those that meet specifications, and determines an interconnection pattern to achieve a desired electronic function. It then generates a set of photographic masks to interconnect the circuits on the slice.

The most dramatic advantage of the technique is the ability to respond quickly to custom-design requirements. With computer-aided design, TI now is producing prototype LSI arrays in only six to eight weeks, beginning with customers' design equations. This cycle is being shortened steadily.

Selection of discretes simplified

TI strengthened its capacity to serve both small and large companies in the growing industrial market by installing a system of "preferred semiconductors." By computer analysis the 285 most frequently used items were selected from the 15,000 standard and special products manufactured by TI.

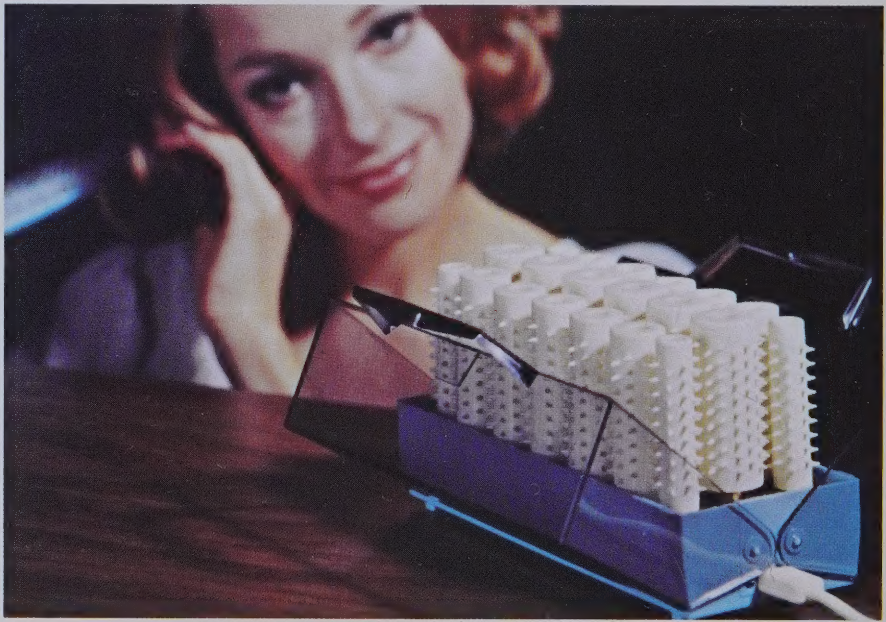
Those selected, including transistors, diodes, light sensors, and resistors, are stocked in depth by the company to assure customers immediate off-the-shelf delivery.

Plastic packaging gains

Plastic encapsulaton of transistors and integrated circuits became increasingly important to TI in 1968. This is a high-volume production packaging technique which provides environmental protection for semiconductor devices at less cost than metal "canning."

A single-diffused process was developed for the manufacture of silicon power transistors. By using this process, and plastic packaging, TI is producing a high-performance item inexpensive enough to compete successfully for such applications as automobile electrical assemblies, stereo record players and calculators. A line of plastic encapsulated, miniaturized, small-signal transistors was introduced for use in hybrid circuits for radios and electronic organs.

Silect transistors for television sets and other consumer products were among the plastic-packaged discrete components made in greater quantities during the year. In addition to market gains in the U.S., TI plastic-packaged transistors and integrated circuits dramatically penetrated European industrial and consumer markets.



Curler set sold in U.S. by Clairol has an international background. It is manufactured by Carmen in Denmark and has a one-half-inch thermostat made by Texas Instruments Holland.

TI electrical control in left hand protects fluorescent light ballast in right hand from dangers of overheating. New industry safety standards require a protector for each ballast.

Both current and projected growth in TI's semiconductor business called for increased production capacity in 1968. Facilities were added in Dallas and Sherman, Texas; in the Netherlands Antilles; and in England. Construction was started on an additional plant in West Germany.

In April, TI and Sony Corporation established a Japanese company known as Texas Instruments Japan Limited, with each company furnishing 50% of the initial capital. The company will manufacture semiconductor components and electrical control products.

New markets develop for controls

Control products gained a greater share of the U.S. electrical appliance and climate control markets in 1968 with established lines of thermostats, relays and thermal overload protectors. In the international market, sales were especially strong in Holland, Italy, Canada, and Latin America.

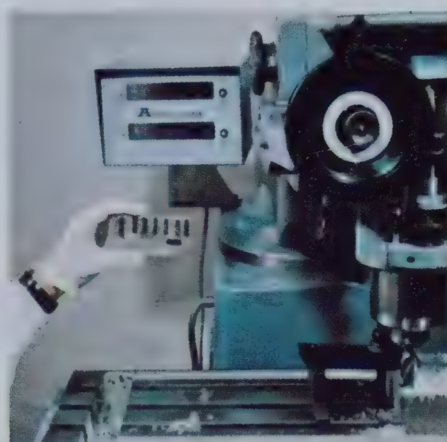
A new market opened up in the U.S. for thermal controls designed to protect fluorescent lamp ballasts. New industry safety standards specify that ballasts now must be made with such devices pre-set to cut off the current if the unit overheats. TI has expanded capacity to produce millions of these protectors yearly.

TI in 1968 further penetrated a number of major markets for precision controls, including aerospace, telecommunications, data processing, and computer peripheral equipment. For instance, TI circuit breakers and other electrical controls are in all three new large "air bus" commercial aircraft. The Apollo 8 spacecraft contained more than 300 TI precision switches and numerous semiconductor components.

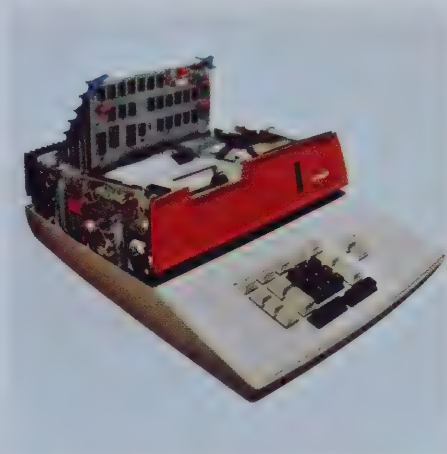
Manufacturing capabilities for control products were expanded during 1968, including the occupancy of a major portion of a new 185,000-sq ft building on the Attleboro site.

NEW INDUSTRIAL APPLICATIONS OF INTEGRATED CIRCUITS

show the increasing utility of electronics in our lives, performing functions that were not practical or even possible with items that were mechanically designed. These examples typify use of TI custom engineering to help solve specific customer problems.



Machine tool operators normally measure distances and the amount of metal removed with a slow "stop and check" procedure. Anilam Electronics believed that integrated circuits could make the work easier and consulted TI's Customer Engineering Center. The result of joint development efforts is this low-cost continuous measuring system using 61 TI integrated circuits. Electronic counting circuits replace conventional mechanical measuring devices in machine tools. Now, even inexperienced operators can reduce setup and measuring times by as much as 90%, yet read to accuracies of a few ten-thousandths of an inch.



Engineers of the Friden Division, The Singer Company, using new TI circuit designs, were able to develop a compact desk-top programmable calculator that combines both electronics and tape printer in a single unit. TI engineers achieved the equivalent of more than 90 basic circuits (gates) in three customized integrated circuit packages. These and other circuits, mounted on a total of six circuit boards, helped the customer lower manufacturing costs and increase reliability. The new calculator is capable of learning up to 30 program steps, greatly simplifying and speeding the solution of complicated mathematical problems.

Transmarine Corporation asked TI to study the problem of improving the reliability of their currency changers. The solution was a special circuit design that includes a standard linear integrated circuit. New approach not only gave Transmarine opportunity to build plug-in circuit boards to bring existing units up to new standards, but also reduced customer's manufacturing costs on new equipment. The newly designed currency changer makes positive evaluations even under adverse conditions that confused earlier validating mechanisms and makes practical vending machines and changers which reliably accept $5 and $10 bills.

Equipment and systems:
Record sales and deliveries

Record quantities of digital seismic equipment, radar systems, electro-optic systems, ordnance hardware and classified electronics equipment were delivered during 1968. The backlog of orders for equipment and systems continued to grow to a new high at year end.

In the government equipment business, the makeup of the manufacturing backlog is encouraging because of its high content of TI-designed equipment for longer-range military programs. Research and development activity on new long-term programs was at an all-time high at year end, despite recent pressures on government R&D budgeting.

Production of the Shrike missile continued in 1968. A new contract for more than $9 million was entered in September, bringing the total for the program to more than $100 million. Laser guidance devices for use with conventional bombs were shipped in increasing volume during the year.

In the industrial marketplace, sales of digital field seismic equipment, strip chart recorders, and X-Y plotters exceeded 1967 totals. Airlines and the U.S. Government bought air data test equipment for calibration of aircraft altitude and speed instruments.

□ *Special attention is given in the following pages to three technologies of particular significance to TI's equipment and systems business: radar, electro-optics and digital data processing. A high degree of vertical integration exists in each of the areas. This enhances equipment and system solutions to customers' problems through the use of company skills in materials, components and services.*

□ TI leads in radar technology

More than 170 of the major airports in this country and abroad rely on TI Airport Surveillance Radar (ASR) for detection and tracking of aircraft within 60 miles of the terminal.

In 1968 the company began developing the next generation of the ASR system, with initial installations for the Federal Aviation Agency scheduled for 1970. The design is based on solid-state components for improved reliability and economy. The system also incorporates a new digital data processing technique to separate radar signals of moving aircraft from signals reflected by stationary objects.

TI airborne radar has contributed to the effectiveness of military aircraft for two decades. It has solved problems involving target detection, navigation, low-altitude flight, weapons delivery, and adverse weather penetration.

An important contract for avionics system integration and new radar equipment for the Air Force C-130 aircraft was awarded the company in 1968. Part of the Adverse Weather Aerial Delivery System (AWADS), the new avionics system enables aircraft to deliver cargo by parachute with pinpoint accuracy anywhere in the world, by night or day, and under almost all weather conditions.

The primary sensor for the AWADS system is a new radar with unique dual-frequency operation. One frequency is selected for long-range weather detection and navigation; the second for detection and precise location measurements of the cargo release areas. Although being designed initially for the C-130, this radar can be used equally well in other aircraft, including the C-141 and C-135 cargo aircraft.

In July the first engineering model of an advanced antisubmarine radar was delivered to the U.S. Navy for evaluation testing. Work continues on flight test models of this system specified for use in the Navy's planned, new carrier-based aircraft, the VSX. Production deliveries began in 1968 on a new radar used in the Navy P-3C land-based antisubmarine aircraft. Production also started on new airborne radar for four military aircraft: the Navy and Air Force A-7D and E, and Air Force F-111D and FB-111.

Contracts were received for development and initial production of digital processors for use with TI radars in the RF-4C and other Air Force aircraft. These processors cancel radar signals received from stationary objects so signals from moving targets, such as vehicles, can be seen. Equipment reliability, compactness and economy are enhanced by use of the company's LSI arrays, each containing 700 digital circuits.

The MERA (Molecular Electronics for Radar Application) radar, described in the 1967 report, continued in development. The capability of this all-solid-state radar to detect targets by electronic scanning over wide angles without antenna motion was demonstrated. Design studies are under way for the Air Force on an advanced multifunction radar using MERA technology. As a result of TI's pioneer work in this field, basic patents were issued in the U.S. in 1968.

TI pioneered the development of forward-looking radar systems such as this model shown undergoing final performance tests before installation on a U.S. Air Force or Navy A-7 tactical aircraft. Similar types of TI radar are supplied to the Air Force and Navy for fighters, bombers and reconnaissance planes in current production. Radar aids navigation, low-level flight, other functions.

☐ Electro-optics—problem solver

During 1968 TI expanded and strengthened its position in electro-optics, a dynamic technology that is another excellent example of vertical integration in the company. It combines TI's technical resources in such areas as materials, solid-state electronics, infrared, optics, and lasers.

Serving U.S. military needs continues to be the prime objective of TI's electro-optic programs. The ability of airborne infrared sensors to give a near-photographic image of the earth's surface, even at night or through an overcast, makes infrared invaluable for military intelligence. It is significant that Texas Instruments is supplying infrared sensors for the three principal U.S. military reconnaissance aircraft.

Night vision programs expand

A milestone was reached in 1968 with initial deliveries of third-generation Forward-Looking Infrared (FLIR) systems. FLIR makes it possible for tactical aircraft to deliver weapons at nighttime and under poor visibility conditions by providing a continuous TV-like display of the terrain and targets. Key components of the system include mercury-doped germanium detectors, infrared transmitting glass, gallium arsenide emitters, and the *TIVICON* electronic infrared camera tube. These products – and the system combining them – were developed simultaneously by the integrated efforts of several different TI activities in materials, components and equipment. This parallel development made it possible to use the most advanced technology in each area, illustrating the importance of vertical integration to TI customers.

The Night Vision Aerial Surveillance System (NVASS) will provide night-vision capability to Army helicopters. It will illuminate targets with invisible radiation from a solid-state gallium arsenide array and then detect the reflected energy. A key part of NVASS is a new laser, built by TI, to designate targets.

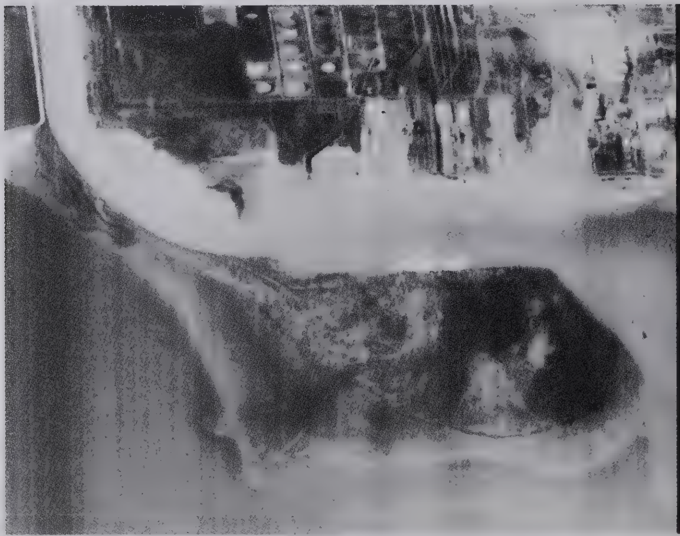
Commercial uses developed

Several new commercial applications of electro-optic technology have emerged. Infrared's capability to make more sophisticated investigations of watershed, drainage and water pollution shows definite promise. Research also seeks to measure the effectiveness of infrared sensors in locating potential accumulations of minerals and in appraisal of soils, forests and wildlife.

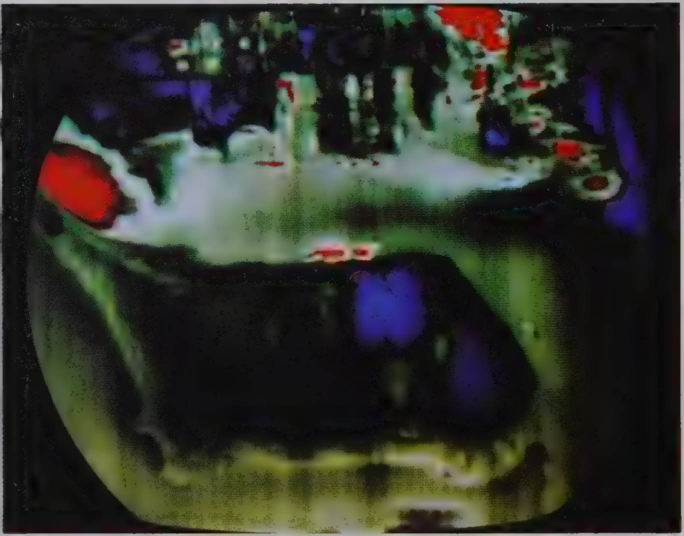
TI delivered a prototype medical thermographic instrument to a major hospital for evaluation. A high-resolution infrared scanner is used to measure body temperatures within one-twentieth of a degree F. and produce a permanent image of the body area scanned. Preliminary results have shown the instrument's value as an aid in diagnosing tumors.

An unusual application for TI laser technology is to help the U. S. Post Office Department accelerate the mail service. Design work began on a laser system to provide a clear view of addresses on mail of varying thickness moving rapidly on a remote conveyor. This will help the operator make fast sorting decisions.

Lasers are in development for trimming, cutting and welding in semiconductor manufacturing operations.



In this conventional black and white TI infrared image of the ship channel at Texas City, Texas, the warmest areas are lightest in tone, such as the barges near the peninsula at center, the oil storage tanks, and discharge of warm water into the channel at left.



To enhance interpretation, new TI technique converts black and white infrared imagery into multiple color ranges on television tube. Warmest areas are red. Experimental laboratory photograph shows the concept, but not the degree of clarity possible with technique.

Technician is making final adjustments before flight test of this TI "invisible light" illuminator array. It is a key unit of a new U.S. Army Night Vision Aerial Surveillance System (NVASS).

Each of the tiny cells in the illuminator array shown here contains a gallium arsenide emitter and a gold-plated reflector for directing the near-infrared energy, which is not visible to the human eye.

□ Digital data processing

Since the early 1960's TI has designed and produced digital equipment for seismic data collection and processing in petroleum exploration. During this period, the company has multiplied several fold the effectiveness of extracting meaningful information from seismic data. This has been accomplished by combining the skills of TI's geophysical, components and systems businesses. The essential elements were knowledge of geophysical exploration problems, development of sophisticated related software, production of advanced semiconductor components, and design and manufacture of digital equipment.

Of particular significance in 1968 was the excellent market acceptance of the third-generation *DFS III* digital field system for collecting marine and land seismic data. Production continued on the third-generation 870A seismic processing system. The all-integrated-circuit 870A is compatible with the newest seismic interpretive processing programs because of its large memory capacity and high speed. Hardware and software development was initiated on a more powerful processor intended to replace the 870A in the early 1970's for such scientific applications as seismic processing.

Technology applied broadly

The digital processing technology developed on the seismic program has been applied to other business areas within TI. Advancements occurred in two such areas in 1968: military electronics and factory systems.

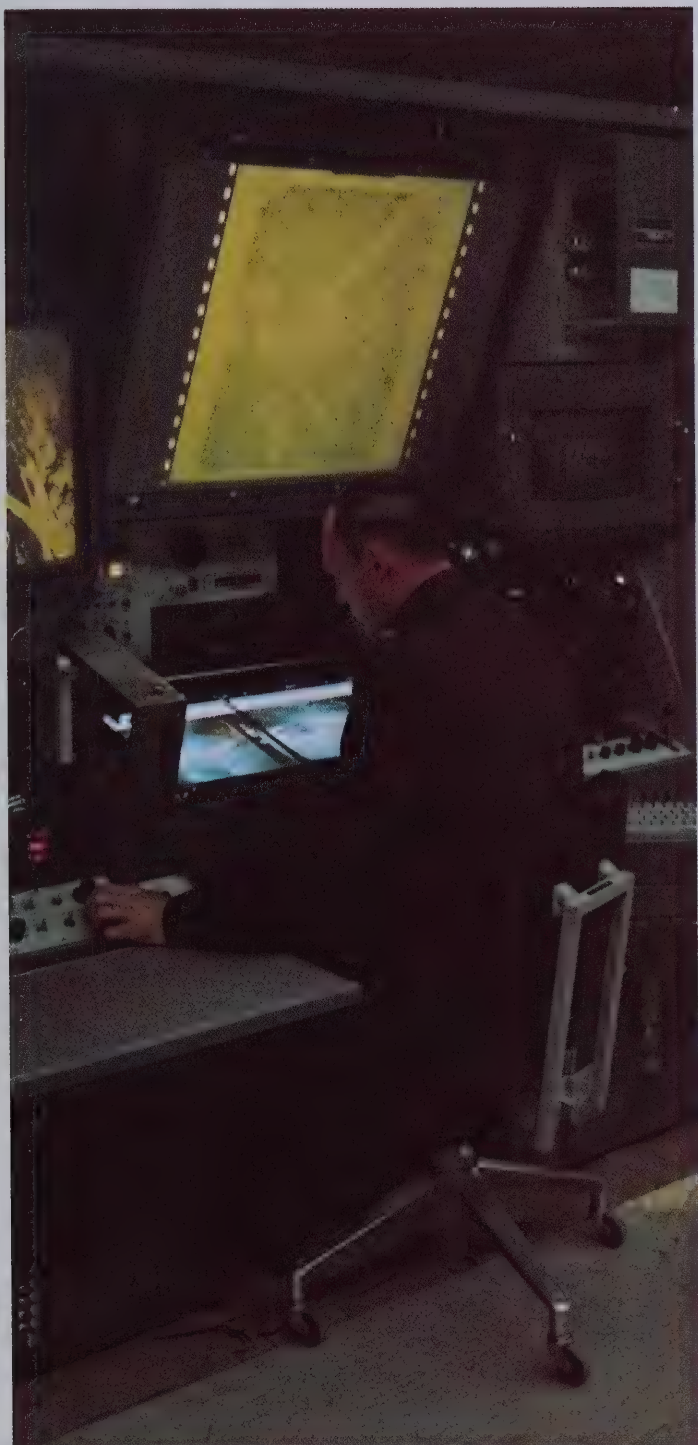
TI has initial contracts on key military programs with good long-term potential. On two of these, the new TI 2500 series digital computers will be used. Production quantities of one version were sold to the U.S. Navy for shipboard computation functions, such as navigation using information from a satellite. A second version of the 2500 series increases the capability of the photo interpreter in the Tactical Information Processing and Interpretation (TIPI) program for which TI is the prime contractor. The 2500 series design also is used in a demonstration computer under an Air Force contract to develop LSI circuits. An engineering model in which LSI circuits are used for memory, interfaces and all logic functions, was in the testing phase at year end.

Digital processing technology was an important factor in the award of the contract for the Adverse Weather Aerial Delivery System (AWADS) mentioned previously. TI will supply the digital interface equipment and the software to integrate an available Air Force digital computer with the complete AWADS avionics system.

Continued emphasis was placed on solving factory systems problems using digital processing technology. The 861 and APC 980 small factory systems computers continued in production. Applications include testing of semiconductor products and electronic modules, as well as electronic message switching in telecommunications centers.

The *TACTICOM* factory data collection system successfully completed extensive operational tests in initial customer installations. The system collects data on labor, materials and attendance for rapid transmittal to a computer center. Production increased on magnetic tape transports used with *TACTICOM* systems, factory test systems and seismic equipment.

New integrated circuit DFS III digital seismic data collection system is shown in a shipboard installation. Users like its versatility and reliability on land and sea.



TI computer in this Tactical Information Processing and Interpretation sub-system (TIPI) automates interpretation process and computes target locations in radar, photo and infrared aerial reconnaissance imagery.

New TACTICOM factory data system shown in customer installation collects labor, materials and attendance data for transmittal to computer, reduces chances for human error.

Services:

1968 was year of improvement

In petroleum geophysical exploration, data collection operations were considerably more productive and profit margins improved as a result.

Marine data collection operations showed the greatest 1968 improvement with several factors contributing to this upturn. These included greater use of non-dynamite energy sources, improved ocean-going seismic exploration vessels with better recording equipment, and an organizational realignment to place all marine production under a single manager. A worldwide Dallas-to-ship, two-way radio communication system improved efficiency of ship operations.

Land operations accounted for most of the 1968 seismic equipment capital investments. New capacity was needed to keep pace with customers' heightened interest in new exploration areas. As examples, several new TI crews began operations during the year on the North Slope of Alaska and in northern Canada.

TI continued industry leadership in digital seismic data processing and added in Denver the eleventh computer in a worldwide network. Capability of the Dallas center was increased with installation of the new TI 870A seismic data processor.

Advanced seismic data processing software introduced

In 1968, approximately 60% of the seismic exploration in the Free World was conducted by the digital technique introduced commercially by TI in 1963. Another advance in software programs was introduced to the petroleum industry in September—the Series 600/3-Dimensional Interpretive Processing Package. It employs the 870A processor and an on-line, high-precision cathode ray tube photographic display to improve the quality and quantity of subsurface information extracted from seismic data. In

Variety of energy sources TI uses to collect seismic data for oil company clients is illustrated by crews drilling dynamite shot holes in Alaska's North Slope, above, and burying explosive cord in the sands of North Africa, below. TI also processes and evaluates data.

addition to increasing the productivity of seismic interpretive staffs, the new package is designed specifically to help locate hard-to-define structures and stratigraphic traps.

Contracts were expanded in the U.S. and Australia for the new airborne resources exploration service, introduced in 1967 to locate mineral deposits such as uranium and potash by detecting their gamma radiation.

TI Supply Company: worldwide expansion continues

TI Supply increased in importance as a sales outlet for TI products with aggressive market expansion in the U.S. and Europe. Products of more than 350 other electronic and industrial manufacturers also were distributed. An integrated communication and computer inventory and order-handling system makes possible same-day shipments on an average of 80% of stock items ordered.

A new center was opened in 1968 to provide testing services on integrated circuits and semiconductor components for customers in the New York City area.

Individual and team development

Significant progress was made in 1968 toward broadening the participation of employees in planning and controlling their work.

To generate more personal involvement and commitment, the company has developed a team approach to problem solving. Natural work groups are identified, and individuals in each analyze their own jobs, suggest improvements, and score progress against individual and team goals.

To support the more responsible leadership role the team approach requires, more than 1400 supervisors and managers completed special training by the end of the year. They, in turn, led 7500 TIers in programs to achieve greater team effectiveness.

Although the long-range program still is in development, its impact has been felt at all levels of the company. Through the team approach, more people than ever before became deeply involved in annual planning in the early, formative stages. The result was better plans and heightened personal commitment to organizational goals. Experience also indicates that management teams have a clearer definition of motivational problems and approaches to their solution.

Job opportunities broadened

TI has a heavy investment in its most important asset—people. To help develop their careers within the company, and to make best use of their abilities, the Job Opportunity Program was expanded in the U.S. during 1968. It is a formalized system of expediting job transfers and promotions within the company. More than 3900 employees took advantage of new job opportunities which were listed and broadly communicated in the U.S. on a regular basis during the year. The program not only improves work satisfaction, but it reduces the expense of recruiting persons with equivalent experience.

The number of employees increased by 21% to 46,747 at year end to operate TI's growing businesses around the world. Included were a record number of almost 600 high-caliber graduates who joined through the 1968 U. S. college recruiting program.

In a week-long training seminar TI managers prepare for more effective leadership roles. Small groups such as this gain team interaction experience in solving hypothetical problems. Later they will apply new knowledge in their own natural work group situations.

Outlook:

New Board member

On February 1, 1969, John B. Connally became a Director and Officer of the Board. He has just concluded his third term as Governor of Texas, and was formerly Secretary of the Navy.

This represents another step in restructuring the Board as proposed at the annual shareowners meeting in 1967. The first Officer of the Board to be elected was S. T. Harris, formerly a senior officer of the company. His duties now relate entirely to his functions as a Director and Officer of the Board of Directors.

The new Board concept calls for a mix of backgrounds in those elected to be Directors and Officers of the Board, including men whose principal background and occupation have been outside TI. Mr. Connally is the first Director elected Officer of the Board whose principal background and occupation are outside TI.

Attention of President Shepherd, left, and Chairman Haggerty is on new airborne digital computer, the first computer application of Large Scale Integration (LSI) circuits. Each 2-inch-square circuit package, shown on top of unit, contains functional equivalent of more than 70 conventional integrated circuits. Computer, with 34 LSI circuits, controls functions of MERA solid-state radar.

Resource allocation process

A new and significant approach to decision making and resource allocation was added to TI's 1969 planning process. This planning system involves organized preparation, analysis and priority ranking of "decision packages"—each a group of interdependent action programs. Each decision package defines all plans and resources necessary to achieve a goal expressed in the company's Objectives-Strategies-Tactics system, explained in prior reports. Decision packages can therefore involve innovative programs in marketing and manufacturing as well as development of new products and services. Decisions are made after an analysis and ranking process which considers near-term and long-term company priorities together with the availability of resources including financial and human.

Through this process which involved all levels of management, the 1969 programs have been selected. The outlook is encouraging for such programs to increase profits by improving manufacturing margins and increasing market penetration. There is a strong technological and innovative manpower base to support the growth programs.

In addition to plans already approved, TI has a sizable "creative backlog" of excellent, but lower-ranked programs derived from the decision package inputs. These stand-by programs are ready to start when conditions change or the necessary resources can be justified.

The continued growth and success of the company have been due to the contributions and efforts of many groups and persons—customers, suppliers, shareowners, and especially the men and women of Texas Instruments. We thank all for their strong interest and support.

Progress to date in 1969 is satisfactory and we expect sales and earnings gains over 1968. We will keep you informed of further developments during the year.

P. E. Haggerty
Chairman of the Board

Mark Shepherd, Jr.
President

Dallas, Texas

February 28, 1969

WORLDWIDE OPERATIONS

☐ Manufacturing facilities:

Chemical materials:
Dallas, Texas
Bedford, England
Richmond Hill, Ontario, Canada

Metallurgical materials:
Attleboro, Massachusetts

Semiconductor products:
Dallas, Sherman, and Houston, Texas
Richmond Hill, Ontario, Canada
Bedford, England
Nice, France
Freising, Germany
Aversa, Italy
Curacao, Netherlands Antilles
Tokyo, Japan

Electrical controls:
Attleboro, Massachusetts
Versailles, Kentucky
Central Lake, Michigan
Richmond Hill, Ontario, Canada
Almelo, Holland
Aversa, Italy
Buenos Aires, Argentina
Sao Paulo, Brazil
Mexico City, Mexico
Elizabeth, Australia

Equipment and systems:
Dallas, Sherman, Austin, and Houston, Texas
Ridgecrest, California
Bedford, England

TI Supply Company stocking locations

Dallas and Houston, Texas
Tulsa, Oklahoma
Denver, Colorado
Kansas City, Missouri
Chicago, Illinois
Boston, Massachusetts
Lake Success, New York
Clark, New Jersey
Santa Monica, California
Montreal, Quebec, Canada
Toronto, Ontario, Canada
London, England
Helsinki, Finland
Copenhagen, Denmark
Amsterdam, Holland
Munich, Germany
Paris, France
Milan, Italy
Madrid, Spain

Digital seismic data processing centers

Dallas, Houston, and Midland, Texas
New Orleans, Louisiana
Denver, Colorado
Los Angeles, California
Calgary, Alberta, Canada
London, England
Beirut, Lebanon
Tripoli, Libya
Sydney, Australia

as of December 31, 1968

Operations	1968	1967	1966
Net sales	$671,230	$568,507	$580,314
Income before provisions for income taxes, redeterminations, and renegotiation	50,362	41,098	63,722
Provisions for income taxes, redeterminations, and renegotiation	24,038	18,243	29,768
Net income	26,324	22,855	33,954
Earned per common share†			
—average outstanding during year	2.41	2.11	3.30
—outstanding at year end	2.41	2.10	3.14
Cash dividends paid per common share†	.80	.75	.55
Financial Condition			
Total current assets	$277,393	$242,915	$253,705
Total current liabilities	120,235	97,520	112,142
Working capital	157,158	145,395	141,563
Property, plant, and equipment at cost	270,956	242,579	200,126
Accumulated depreciation	125,121	103,696	76,374
Property, plant, and equipment (net)	145,835	138,883	123,752
Other noncurrent assets	5,326	5,564	5,903
	308,319	289,842	271,218
Long-term debt, less current portion	52,927	54,265	51,935
Deferred incentive compensation	1,930	1,443	1,963
Shareowners' equity	$253,462	$234,134	$217,320
Common shares (average outstanding during year)†	10,909,686	10,845,663	10,291,973

Incorporated and Subsidiaries *In thousands of dollars*

					Years Ended December 31	
1965	1964	1963	1962	1961	1960	1959
$436,369	$327,579	$276,477	$240,693	$233,223	$232,713	$193,213
46,273	34,857	25,087	16,381	19,892	29,435	28,855
21,434	16,816	12,948	7,824	10,446	13,947	14,712
24,839	18,041	12,139	8,557	9,446	15,488	14,143
2.46	1.80	1.22	.85	.95	1.57	1.44
2.46	1.80	1.21	.85	.94	1.57	1.43
.50	.40	.32	.24	—	—	—
$186,721	$123,500	$105,967	$ 90,263	$ 82,479	$ 72,351	$ 64,842
89,072	65,627	50,985	37,216	36,280	35,197	37,266
97,649	57,873	54,982	53,047	46,199	37,154	27,576
139,175	106,349	93,510	81,651	78,736	73,676	60,806
57,960	49,995	45,658	39,017	33,699	27,646	20,083
81,215	56,354	47,852	42,634	45,037	46,030	40,723
3,544	1,003	627	433	453	285	429
182,408	115,230	103,461	96,114	91,689	83,469	68,728
48,708	3,937	5,700	7,463	9,225	10,988	12,000
1,082	—	—	—	—	—	—
$132,618	$111,293	$ 97,761	$ 88,651	$ 82,464	$ 72,481	$ 56,728
10,091,248	10,011,217	9,894,919	9,866,837	9,836,509	9,801,803	9,755,055

†*Adjusted for 2-for-1 stock split in 1966 and for the 25% stock distribution in 1963. Earnings per share are computed after preferred dividends in 1959–63. (There was no preferred stock outstanding subsequent to 1963.)*

Income and Retained Earnings

	For the year ended December 31 **1968**	For the year ended December 31 **1967**
Net sales	$671,230	$568,507
Operating costs and expenses		
Cost of goods and services sold	512,494	427,466
General, administrative, and marketing	97,352	87,647
Employees' retirement and profit sharing plans	12,071	12,400
Total	621,917	527,513
Profit from operations	49,313	40,994
Other income (net)	4,258	3,105
Interest on loans	(3,209)	(3,001)
	50,362	41,098
Provisions for income taxes, redeterminations, and renegotiation	24,038	18,243
Net income	26,324	22,855
Retained earnings at beginning of year	156,076	141,908
Cash dividends declared on common stock—80¢ per share	(8,738)	(8,687)
Retained earnings at end of year	$173,662	$156,076
Earned per common share (average outstanding during the year)	$ 2.41	$ 2.11

Sources and Uses of Working Capital

	1968	1967
Sources of working capital		
Net income	$ 26,324	$ 22,855
Depreciation and amortization	41,670	37,451
Cash flow from operations	67,994	60,306
Proceeds—common stock under options	1,742	2,646
Long-term borrowing of overseas subsidiaries	1,340	2,330
	71,076	65,282
Uses of working capital		
Additions (net) to property, plant, and equipment	48,423	52,521
Dividends on common stock	8,738	8,687
Repurchase of debentures	2,678	—
Other	(526)	242
	59,313	61,450
Increase in working capital	$ 11,763	$ 3,832

See accompanying notes.

Texas Instruments Incorporated and Subsidiaries *In thousands of dollars*

Balance Sheet

	December 31 1968	December 31 1967
Assets		
Current assets		
Cash and short-term investments	$ 77,432	$ 72,217
Accounts receivable	107,746	95,982
Inventories (net of progress billings)	84,953	70,375
Prepaid expenses	7,262	4,341
Total current assets	277,393	242,915
Property, plant, and equipment at cost	270,956	242,579
Less accumulated depreciation	125,121	103,696
	145,835	138,883
Other assets and deferred charges	5,326	5,564
	$428,554	$387,362
Liabilities and Shareowners' Equity		
Current liabilities		
Loans payable (principally overseas subsidiaries)	$ 13,910	$ 8,120
Accounts payable and accrued expenses	65,473	55,058
Income taxes, redeterminations, and renegotiation	26,564	19,766
Accrued retirement and profit sharing contributions	12,099	12,400
Dividends payable in January	2,189	2,176
Total current liabilities	120,235	97,520
Deferred liabilities		
Long-term debt	52,927	54,265
Incentive compensation	1,930	1,443
Total deferred liabilities	54,857	55,708
Shareowners' equity (common shares outstanding at year end: 1968–10,940,190; 1967–10,877,119)	253,462	234,134
	$428,554	$387,362

See accompanying notes.

NOTES TO FINANCIAL STATEMENTS

OPERATIONS OUTSIDE UNITED STATES

Approximately 24% of consolidated net sales for 1968 was from operations outside the United States and a somewhat lower percentage of net assets at December 31, 1968, was located in such areas.

INVENTORIES

Inventories are stated at the lower of cost, replacement market or estimated realizable value. Cost is computed on a currently adjusted standard or average basis.

	Thousands of Dollars	
	1968	*1967*
Materials and purchased parts	$ 37,523	$ 29,836
Work in process	73,723	50,018
Finished goods	14,178	11,219
Less progress billings	(40,471)	(20,698)
	$ 84,953	$ 70,375

PROPERTY, PLANT, AND EQUIPMENT	Thousands of Dollars	
	1968	*1967*
Land	$ 4,340	$ 3,818
Buildings	99,356	91,340
Machinery and equipment	167,260	147,421
	$270,956	$242,579

Depreciation on a major portion of fixed assets has been computed by either the double declining balance or the sum-of-the-years digits method.

LONG-TERM DEBT	Thousands of Dollars	
	1968	*1967*
4.80% sinking fund debentures due 1990; sinking fund payments due $2,322,000 in 1972 and $2,500,000 annually thereafter	$ 47,322	$ 50,000
Notes payable (overseas subsidiaries)	7,554	5,638
	54,876	55,638
Less amounts due within one year included in loans payable	1,949	1,373
	$ 52,927	$ 54,265

In 1968, debentures in the principal amount of $2,678,000 were repurchased and have been applied as a reduction of long-term debt.

Aggregate maturities of notes payable (overseas subsidiaries) during the five years subsequent to December 31, 1968, are as follows: 1969 – $1,949,000; 1970 – $392,000; 1971 – $2,793,000; 1972 – $1,460,000; 1973 – $532,000.

RETIREMENT PLANS

Employees of the company and its principal subsidiaries are covered by non-contributory retirement plans. The company's policy is to fund retirement costs annually. Total expense under the plans was $7,658,000 in 1968 and $8,584,000 in 1967. During 1968, a change in actuarial assumptions had no significant effect on net income.

SHAREOWNERS' EQUITY

			Thousands of Dollars	
	Year	*Shares*	*1968*	*1967*
Cumulative preferred stock, $25 par value; authorized 750,000 shares			$ —	$ —
Common stock, $1 par value				
Authorized		12,500,000		
Issued	1968–	10,965,712	10,966	
	1967–	10,906,486		10,906
Additional paid-in capital			68,834	67,152
Retained earnings			173,662	156,076
			$253,462	$234,134

Shares issued include 25,522 and 29,367 in 1968 and 1967, respectively, purchased for awards under the company's incentive compensation plan and included in other assets and deferred charges.

During 1968, $59,000 was added to common stock and $1,682,000 was added to additional paid-in capital as the result of issuance of 59,226 shares on exercise of stock options.

STOCK OPTIONS AND RESERVATIONS OF COMMON STOCK

At December 31, 1968, 226,466 shares of common stock were reserved for then outstanding options (aggregate option price $6,393,000) under a 1957 restricted stock option plan, such options being exercisable through 1973 contingent upon the attainment of specified earnings per share. Of the total, 119,789 shares had become exercisable at December 31, 1968. This plan terminated as to further grants in 1965. During 1968, options on 56,982 shares (total consideration $1,636,000) were exercised and options on 8,220 shares were terminated.

Also 579,765 shares of common stock were reserved at December 31, 1968, under a 1965 qualified stock option plan for officers and key employees, including 174,150 shares (aggregate option price $16,061,000) for then outstanding options, of which 42,018 shares were then exercisable. These options expire five years from date of grant and become exercisable over the last four years of the option term in percentage installments, cumulatively, upon attainment of specified earnings per share. During 1968, options on 1,610 shares (total consideration $92,000) were exercised and options on 3,840 shares were terminated.

During 1968, options on 634 shares granted in 1959 pursuant to a merger agreement were exercised (total consideration $13,000). With the exercise of these options the 1959 plan is terminated.

Had the shares of common stock reserved at December 31 for all then outstanding options been shares actually outstanding from the first of the year, there would have been no significant effect on the earnings per share for 1967 or 1968.

ACCOUNTANTS' REPORT

The Board of Directors
Texas Instruments Incorporated

We have examined the accompanying consolidated balance sheet of Texas Instruments Incorporated and subsidiaries at December 31, 1968, and the related consolidated statements of income and retained earnings and of sources and uses of working capital for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. It was not practicable to confirm certain accounts receivable, as to which we satisfied ourselves by means of other auditing procedures.

In our opinion, the statements mentioned above present fairly the consolidated financial position of Texas Instruments Incorporated and subsidiaries at December 31, 1968, the consolidated results of their operations, and sources and uses of their consolidated working capital for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Dallas, Texas
February 15, 1969

ARTHUR YOUNG & COMPANY

DIRECTORS AND OFFICERS

Directors

P. E. Haggerty, *Chairman*
John B. Connally, *Officer of the Board*
Cecil H. Green
S. T. Harris, *Officer of the Board*
J. E. Jonsson, *Honorary Chairman*
Ewen C. MacVeagh
Eugene McDermott
Mark Shepherd, Jr.
C. J. Thomsen

Corporate Officers

P. E. Haggerty, *Chairman of the Board and Chief Executive Officer*
Mark Shepherd, Jr., *President and Chief Operating Officer*

Materials and Services Group

E. O. Vetter, *Group Vice President*
Philip J. Gomez, *Vice President*
Jay Rodney Reese, *Vice President*
Mark K. Smith, *Vice President*
Fred C. Ochsner, *Asst. Vice President*
Hans A. Wolf, *Asst. Vice President*

Components Group

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Willis A. Adcock, *Vice President*
John R. Brougher, Jr., *Vice President*
Stewart Carrell, *Vice President*
C. M. Chang, *Vice President*
Edward S. Hill, *Vice President*
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Pierre J. Clavier, *Asst. Vice President*
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James L. Fischer, *Asst. Vice President*
Jack S. Kilby, *Asst. Vice President*
Howard Moss, *Asst. Vice President*
Robert Pierson, *Asst. Vice President*
John A. Powell, *Asst. Vice President*

Equipment Group

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Charles R. DeWeese, *Asst. Vice President*
Liston M. Rice, Jr., *Asst. Vice President*
Joseph P. Rodgers, Jr., *Asst. Vice President*
Sam K. Smith, *Asst. Vice President*
T. E. Smith, *Asst. Vice President*

Corporate Staff

Cecil P. Dotson, *Senior Vice President*
R. C. Dunlap, Jr., *Senior Vice President*
Bryan F. Smith, *Senior Vice President, Secretary and Treasurer*
C. J. Thomsen, *Senior Vice President*
Grant A. Dove, *Vice President*
J. Ross Macdonald, *Vice President*
Gordon K. Teal, *Vice President*
John M. Walker, *Vice President and Controller*
John F. Wilson, *Vice President*
H. J. Wissemann, *Vice President*
Marvin H. Berkeley, *Asst. Vice President*
Ronald F. Keener, *Asst. Vice President*
George E. Livings, *Asst. Vice President*
D. E. Richmond, *Asst. Vice President*
William J. Roche, *Asst. Vice President and Asst. Secretary*
Sol Goodell, *Asst. Secretary*
Harold Levine, *Asst. Secretary*
John R. Vandevoort, *Asst. Secretary*
George L. Williams, *Asst. Secretary*

Common Stock Listed on New York Stock Exchange

Transfer Agents Registrar and Transfer Company (New York), Republic National Bank of Dallas

Registrars Morgan Guaranty Trust Company of New York, First National Bank in Dallas

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